

FOUNDRY FRONTIER

MONTHLY NEWSLETTER

INDIAN FOUNDRIES SEE LARGER DEFENCE PLAY IN RUN-UP TO VIKSHIT BHARAT

— Madhumita Mookerji



India's foundries, largely operating in the MSME segment, are poised to play a pivotal role in the Defence sector as the country advances toward its Vikshit Bharat 2047 vision. With higher allocations in Defence budgets and specific procurement targets from MSMEs, the focus is now on quality, precision and technology upgrades to meet the stringent demands of modern military applications

Defence ministry targets 15% procurements from MSMEs

Automobiles set to shape MSME castings units' future

The country's medium, small and micro enterprises (MSMEs) are expected to play a larger and more definitive role in India's journey towards Vikshit Bharat by 2047. Since the bulk of Indian foundries falls in the MSME space, the call of the hour is that these units must gear up to seize the opportunities that will likely come their way.

For instance, one of the sectors that will be looking at a greater share of indigenous castings procurements, going forward, is, of course, India's Defence sector.

Fully aware of the growing imperativeness of self-reliance in Defence in a world marked

by increasing geopolitical dynamics, the Government of India, increased the allocation in Budget 2025-26 by 9% to INR 6.81 lakh crore in which INR 1.80 lakh crore is towards components, which is primarily the foundry castings market.

Furthermore, as per a government source, the ministry is undertaking programmes to link up with Defence. These include:

Public procurement policy: Here, all government PSUs and departments must procure 25% of their requirements from MSMEs. Furthermore, the Defence ministry has targeted 15% of procurements from Indian MSMEs, which again mainly comprises the castings market. The government is mulling an INR 30-crore common testing facility for Defence-related supplies.

Vendor development programme: This includes exclusive programmes with Defence on foundry requirements and several are being mulled in future, it is learnt.

Technology centres: There are currently 18 while 12 have been added and 26 are in the pipeline. A government source informed that India's Defence sector is undergoing a transformation. The GoI had made a roadmap whereby opportunities have already been laid down in the form of revision in Defence acquisition procedures,

innovation for Defence excellence, and Make in India policy, which are running successfully and these initiatives have allowed products to reach the Defence sector faster. These initiatives are designed for domestic value addition and reducing dependency on imports.

Focus should be on precision casting

However, industry experts feel, areas in which Indian foundries must work include precision casting, since quality control is needed to meet stringent demands of the modern Defence industry. Here, many feel, the Institute of Indian Foundrymen, can play a pivotal role by encouraging investments in new technologies, collaborations with DRDO, DPSUs and private Defence majors as well as MSMEs so that India's foundries can achieve capabilities that can match global benchmarks. Reliability and quality are, of course, of paramount importance.

Automobiles to drive castings MSMEs

Sources in the Ministry of Heavy Industries, Government of India (GoI), have outlined some key points which should be music to the ears of Indian foundry units. For instance, the Indian automobile industry is valued at around \$240 billion. India is the world's largest producer of three- and two-wheelers, and third-largest producer of cars. What's more, sources indicate, the industry will be driven by indigenization and mainly

by the MSMEs.

An important component of Vikshit Bharat by 2047 is Make in India for the World and becoming self-reliant. Such an objective has led to PLIs from the government. Of the 14 PLIs, two are in the Ministry of Heavy Industries -- automobiles and advanced EV cells. The latter is not made in India, and is fully imported, mainly from China. This PLI comprises an INR 18,000-crore scheme where companies in India can manufacture, for which they are given certain incentives. A number of companies are expected to start manufacturing from later this year and early next year, which would be a key step in manufacturing of EVs in India, it may be noted.

The auto PLI, worth INR 26,000 crore, is aimed at production of electric cars. As a result of this, OEMs have to buy components to make these in India. So indirectly, these will benefit MSMEs.

The government has been thinking about the global value chain in automobiles. It may be noted India currently has 3% share in the global value chain in automobiles and in order to increase this, it is imperative for auto units be engage with foundries.

Way forward

“Indian soldiers and foundry members must now walk hand-in-hand, partners in defending our sovereignty and future,”

observed an IIF member. Some important contributions of Indian foundry in Defence include artillery, tanks, engine blocks, gear boxes, subsystems like transmissions and R&D collaborations in newer alloys, stronger and lighter material in ferrous and non-ferrous.

In the next five years, as envisioned by Prime Minister Modi, India's Defence sector will see a growing reliance on indigenously manufactured quality castings. And, Indian foundries are confident they have the potential to not only meet this rising domestic demand but in exports as well.

Auto-focus

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| Advanced EV cells PLI | INR 18,000 crore |
| Auto PLI | INR 26,000 crore |
| India's current share in global auto value chain | 3% |

Govt helping hand

25% procurement from MSMEs

Vendor development programmes

Technology centres



ROADMAP FOR INDIAN FOUNDRIES TO BECOME ATMANIRBHAR IN DEFENCE PRODUCTION

— Madhumita Mookerji

Global defence expenditure has been on a relentless rise for a decade, touching \$2.4 trillion in 2024 and projected to reach \$3.7 trillion by 2035. Against this backdrop, India is sharpening its focus on self-reliance, technology transfer, and manufacturing opportunities in Defence

Geo-politics increasing global military expenditure

DRDO to hike budget by 10% y-o-y for next 5 yrs

Geo-political upheavals are leading to a continuous increase in global military expenditure, which for the past 10 years has increased by around 37% - a worrying rate because this means increased military clashes across the world. What is of concern is, this expenditure has increased for 10 years in a straight row. The global military expenditure for 2024 alone was a humongous \$2.40 trillion with a CAGR of 5.5%. Computed till 2035, it works out to a staggering \$3.70 trillion with a CAGR of 6%.

Thus, the urgency for Defence manufacturing is now at a phenomenally high level. But, how much of this pie have Indian industries been able to get a share



of? More importantly, Indian castings manufacturers?

Where are the opportunities?

Eye on capex budget: The Indian Defence Budget for 2025-26 is at INR 6.81 lakh crore and the Defence capital outlay, at INR 1.80 lakh crore. But it is this capital outlay quantum that is going to get utilised in manufacturing and here innovation and transfer of technology will come into play. Indian foundries do have an opportunity here.

Modernisation is key if it is a Made-in-India project with self-sufficiency as the answer to

India's growing military challenges. There is growing awareness that sourcing technology from any foreign source is difficult. Even if one manages to get the technology it will be 1-2 generations behind. "Integrating that technology into the modern weapons systems leads to a mismatch in the modernization level you want to achieve," remarked a highly placed official at an Indian company involved in Defence manufacturing.

Stress on components not produced in India: The focus should be on extending a product line and investing in the future in components not typically produced in India. For instance, sources in Nelcast, a large foundry entity, elaborated that about five years back, almost 90% of the front axle castings of four-wheeled tractors were imported from China. Today 90% are made in India and 10% imported, underlining a great story of atmanirbharata. "And as a foundry industry we need to strive for more of this," the source stressed.



Industry 4.0 advantage: With foundries in Europe facing financial challenges, many domestic foundries feel there is a great opportunity to not just supply Defence components within the country but globally too.

"We are at the most opportune moment to be a world leader, because under Industry 4.0 every player is on a same level playing field," a foundry source observed.

That apart, Indian castings are possibly the most competitively priced, a factor that can lure importing countries.

DRDO budget expanded: The present DRDO budget is at INR 25,000 crore, which will be increased by 10% every year up to the next five years, as per Dr Maiya Din, Scientist & Director, DF&MM, DRDO. Dr Din said industry support is required so that Indian prototypes can get converted into systems, subsystems and products.

The Technology Development Fund (TDF) which was earlier limited to INR 10 crore, for a small project, has been increased to INR 50 crore.

Procurement procedures simplified:

Furthermore, procurement procedures have been simplified. For instance, when industry partners, especially MSMEs, submit their bids, there is no need to submit EMD. A bid security declaration is sufficient.

“If the item cost is more than INR 20 crore then a pre-contract integrity pact (PCIP) EMD has to be signed, which is 0.5% of the item cost from the previous 2-5%,” Dr Din informed.

Moreover, under the new Procurement Policy for 2025, to reduce delay, DRDO is involving industry partners from the beginning through an “industry partner information system” where potential entities should register first.

Missile missions offer scope: For foundries, there is immense scope in the missile sector especially with newer ones like Astra and Helina, other than Brahmos, Dr Din said, adding that the castings industry may seek greater participation in the development of drone technologies and naval systems - especially torpedoes and submarines.

Higher indigenisation scope: The government recently indicated that the Sukhoi 30 engine should be indigenised. Hindustan Aeronautics (HAL) had approached MIDHANI with respect to super alloys and titanium alloys and special steels. Around 50% of the grades have been developed and in the coming two years the balance 50% will be developed. “By 2028 the engine should be indigenised and by 2030 made operational,” as per sources in MIDHANI. Indeed, the potential for business in Defence is high for foundries. Just consider this: HAL alone imports INR 4,000-

crore of raw materials from outside India since MIDHANI is unable to cater to all Defence needs.

Way forward

First, to be a long-haul player, an understanding of the technology profile is required. Otherwise, after 10-15 years - the timeline typically taken to develop a product – one may encounter repeated decision cycles which can be a serious delaying factor. Developing indigenous technology is imperative, because unless that happens a player will never understand the nuances of industry requirements. When servicing a large entity like the Indian Defence Forces, the stress has to be only on precision.

Secondly, the country needs to keep a check on critical metals needed for Defence production – especially certain composites and alloys used in high-precision equipment manufacturing. Nato and the EU have divided their materials into two categories – high and low risk metals - and have identified metals needed for maintaining their supply chain resilience for operational readiness. A 2023 report from the Ministry of Mines, too has listed 30 critical minerals but out of these, eight have tremendous dependency on China with some like lithium and cobalt, relying 100% on sourcing from the dragon country. So import substitution for these metals is a must and this is where E&D and tech will play a huge

role.

Thirdly, as per the government's Green Channel Certification, an OEM manufacturing the product in Defence can certify it and will be responsible for its quality. Thus, there is a need to put a lot more emphasis on engineering to optimise cost, function and manufacturability.

Arms & the world

Global military expenditure in last 10 years increased by **37%**

Global military expenditure in 2024 at **\$2.40** trillion | **5.5%** CAGR

Global military expenditure over 2024-2035 estimated at **\$3.70** trillion | **6%** CAGR

Areas of opportunities for Indian foundries

Defence capital outlay for 2025-26 at INR 1.80 lakh crore

Components not produced in India

Defence component exports

Expanded DRDO budget

Missile missions



EV DISRUPTION SET TO REV UP NON-FERROUS FOUNDRIES' FUTURE

— Madhumita Mookerji

India's aluminium and copper casting industry braces for rapid growth, but pricing chaos and Chinese dominance remain hurdles

EV disruption pushing ferrous foundries towards aluminium, copper

Pricing volatility prompts demand for a unified pricing index

The silent shift underway in India's foundry industry is finally gaining voice. Long overshadowed by ferrous players, the non-ferrous segment — aluminium, copper and their alloys — is emerging as the new growth engine, powered by the global transition to electric vehicles (EVs),

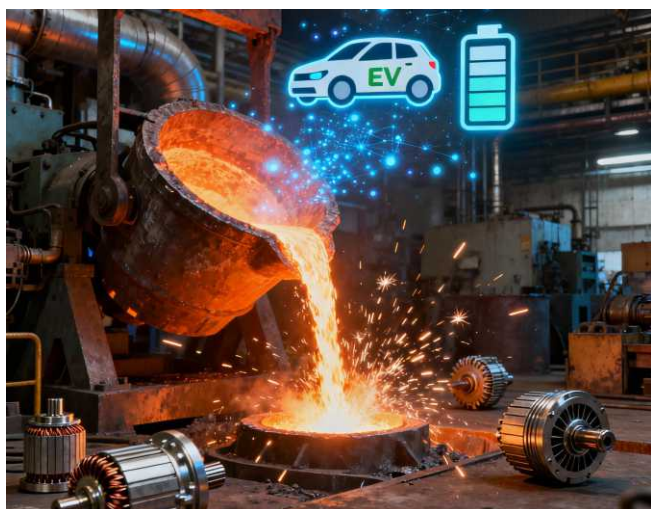
However, this optimism comes with caveats: volatile pricing, heavy import dependence, and a fragmented domestic structure. These factors continue to keep India far behind China in global competitiveness.

The EV factor: Aluminium to replace engines

At present, nearly 30-35% of ferrous foundry capacity is locked in producing engine components. With EVs threatening to erase internal combustion engines altogether, that capacity risks turning idle. “Every ferrous foundry is now aggressively exploring aluminium as an immediate diversifier,” non-ferrous foundry industry expert Anant Bam observed.

The numbers speak: aluminium castings command three to four times the value of ferrous castings, while copper-based castings fetch up to 15 times more, despite lower tonnage. This sharp value differential is drawing foundrymen into the non-ferrous fold.

Applications expanding beyond automobiles



The growth is not just automotive-led, Mr Bam said. Household appliances, white goods, marine equipment, aviation, railways, power transmission and even decorative items are increasingly shifting to aluminium and copper alloys.

Clusters such as Jamnagar (brass), Rajkot (investment castings), Kolhapur and Coimbatore (ferrous-cum-non-ferrous hubs) are seeing rising capacity. Multinationals including Jaguar, Kohler, and Sundaram Clayton already operate dedicated non-ferrous units, catering to both domestic and export markets.

The price puzzle: Industry calls for a common index

Pricing, however, remains the sector's Achilles' heel. While foundries purchase raw material based on spot or daily prices, **buyers benchmark contracts to monthly averages - often delayed by two or three months.** This mismatch leaves foundrymen bearing the brunt of volatility.

For instance, zinc shot up 3% in a single day earlier this year. Copper, governed globally by a handful of majors like Rio Tinto, can swing 10-20% within days. The industry is pushing for a common reference index, potentially spearheaded by BigMint in collaboration with industry associations, to create transparency and reduce disputes.



Sustainability, substitution & technology shifts

The sector faces parallel pressures on sustainability. Carbon footprints and environmental-social-and-governance (ESG) norms are pushing foundries to explore green energy, with some already branding "green castings." Simultaneously, additive manufacturing and laser sintering loom as potential disruptors. Once their costs fall below labour-intensive casting processes, foundries risk redundancy.

On the positive side, input substitution is gaining momentum, particularly in energy, aerospace and Defence. Government-led initiatives and trade fairs are helping Indian

foundries displace imports, with the promise that in 15-20 years, critical imports could be eliminated entirely.

Global trade headwinds: China still the benchmark

India's exports of non-ferrous castings remain a fraction — just 10-15% of China's volumes. Experts point to China's unified structure versus India's fragmented market, where internal price wars hurt margins and distort supply chains.

US tariffs on aluminium and copper (25-50%) may not directly hit India, but indirect effects are expected. Cheaper imports from Southeast Asia and China could flood the domestic market, squeezing local producers. At the same time, Indian foundries must learn to quote on landed cost (door-delivery) terms, not just ex-works pricing, to compete with Chinese suppliers abroad.

Outlook: Growth certain, path uncertain

The consensus is clear: demand for non-ferrous castings will grow at 10-12% annually, supported by EVs, aerospace, Defence, and consumer durables demand. India's non-ferrous capacity currently stands at 2-4 million tonnes, still dwarfed by ferrous but rising rapidly.

Yet, the future of engines — whether these survive through hydrogen or hybrids, or EVs

abolish them entirely — remains the biggest determinant for how aggressively ferrous capacities shift. Meanwhile, sustainability and additive manufacturing represent the next tectonic shifts for the industry.

For now, foundries are caught between opportunity and uncertainty. As one source summed up, "Scope, growth and demand are all positive - but unless India organizes its industry, learns to manage pricing, and keeps pace with technology, China will continue to dictate the rules."

Non-ferrous dilemma

Aluminium to replace engines?: 30-35% of ferrous foundry capacity risks turning idle, Evs diversifying into aluminium

Applications expand: Household appliances, white goods, marine equipment, aviation, railways, power transmission

Growth certain, path uncertain: Growing at 10-12% annually but China factor looms large

